The JOURNAL of GEOGRAPHY

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THE FLORIDA PHOSPHATE INDUSTRY

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Each day we are reminded of the great task which lies ahead of the American farmer in providing food and raw materials for our armed forces, our civilian workers, and the hungry people thruout the world. Many problems arise in connection with this matter of production but one which ranks very high is the maintenance of soil fertility.

The importance of "good" soil has been so deeply impressed upon students of geography that frequently the term is used without giving much thought as to what it implies. One quality which makes soil good is an abundance of plant foods, especially nitrogen, potassium, and phosphate. While other substances are vital to productivity, these three are the quantity plant food minerals and provide the basis for all commercial fertilizers. Numerous agricultural colleges thruout the country reveal that low crop yields are due more often to a phosphorus deficiency than to the lack of any other element. The general acceptance of these findings is shown by the fact that of the 11,000,000 tons of commercial fertilizer used by the American farmers in 1944, approximately one-half was made up of phosphate.

Each year the fertilizer industry normally consumes between eighty and ninety per cent of the output of this mineral. While phosphorus may be obtained from slaughter-house wastes, basic slag of blast furnaces, and guano, the most extensive source is phosphate rock. However, it should be noted that before the plant food is made available, the rock must be ground and treated with sulphuric acid, thus creating a resultant product which is known commercially as superphosphate. The remainder of the output finds a wide variety of uses including the manufacture of tracer

bullets, grenades, smoke screen and incendiary shells, fireworks, and the like. It also is used in the manufacture of matches and is an important element in the striking surface on boxes of safety matches. It is used in rustproofing iron, in dental and china cement, in soft drinks, and in baking powder. A few years ago when the social standing of a lady depended upon the "rustling" of her silk skirt, phosphate was a fairy godmother to many a Cinderella, for when it was used as weighting material in even the cheapest silk, the much desired rustle was produced. It should be remembered, however, that these and many other uses are only minor ones and consume but little of this mineral.

The fertilizer industry uses such a large percentage of the phosphate for three reasons: (1) The amount normally found in the soil is surprisingly low. (2) Plants differ greatly in their ability to absorb and utilize that which is present. (3) Large amounts are removed annually by crops and erosion. Since about seventy-five per cent of the phosphorus utilized by cereals is stored in the grain, it becomes apparent that the farmer who sells grain or animal products derived therefrom is losing his phosphate. Experiments have shown that seven carloads of corn, or six carloads of fat cattle, or the milk from a dairy of one hundred thirty average cows will carry off annually as much phosphorus as is found in the surface six inches of an acre of good ground. When these facts became apparent to Congress, an investigation was started to see if we had sufficient reserves of phosphate rock to meet our future demands. Laws were even proposed to prohibit the exportation of this mineral. After delving carefully into the matter, much information formerly not available to the public was made known and the investigating committee reported that the reserves of Florida alone were large enough to last 4,000 years at the present rate of consumption. It was also brought out that the United States possesses over one third of the world's supply. The only other important deposits are in the U.S.S.R. and North Africa.

The fact that for the past ten years Florida has accounted for approximately three-fourths of the total United States production indicates the importance of the industry in that state. Furthermore, the combined value of all other materials mined in Florida does not exceed that of phosphate. Tennessee is the only important competitor altho reserves are found in Idaho, Utah, and Montana. In

Florida there are three types of deposits which are worked: (1) land pebble, (2) soft rock, and (3) hard rock phosphate.[1]

THE LAND PEBBLE PHOSPHATE REGION

The land pebble region is the greatest area of phosphate production in the United States, accounting for ninety-seven per cent of Florida's output. It is a rectangular belt about sixty-five miles

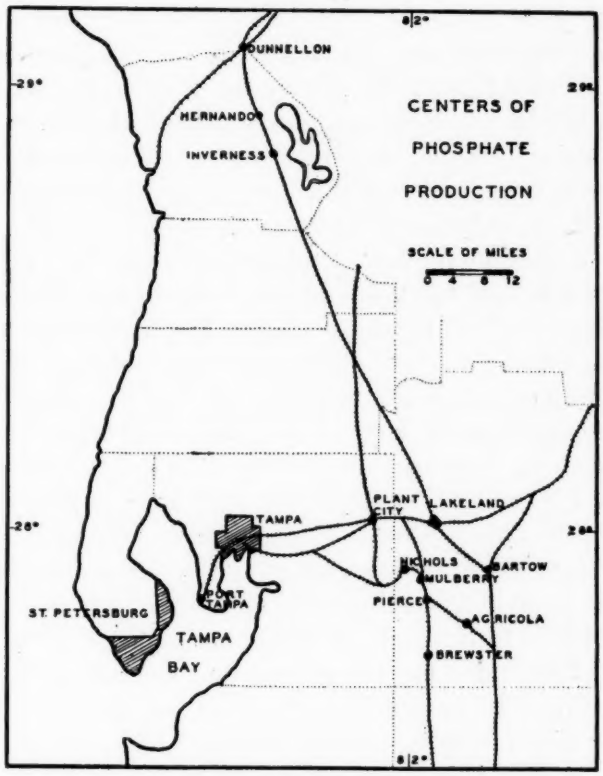

Fig. 1. Map of the Florida phosphate producing region.

long and forty-five miles wide extending southward from the Lakeland Hills. (Fig. 1) As the name suggests, the deposits here are phosphate pebbles varying in size from fine sand to nodules about the size of a man's fist, embedded in a matrix of clay and sand.

[1] Deposits found along streams are called "River Pebble" altho production from this source ceased in 1908.

While the beds vary in thickness from five to fifty feet, the average is about twelve feet. Altho the pebbles themselves usually contain more than seventy per cent phosphate, the mineral content of the matrix is only about twenty per cent. The general flatness of the area supports the theory that these deposits are the remains of once continuous layers of phosphate rock which were eroded by wave action at a time when the sea extended farther inland than at present.

Mining

In places the beds are exposed at the surface while in others they may be buried below twenty or twenty-five feet of clay, sand, and friable sandstone. Since all of the phosphate mines of Florida are of the open pit type, this overburden must be removed. Electrically driven drag lines are used almost exclusively for this purpose, since they make possible the removal of enormous tonnages at very low cost. This leaves a furrowed terrain, the relief of which is determined by the thickness of the overburden. There seems to be no attempt at leveling these ridges, the landscape bearing the scars of the mining process. However, in some areas of this kind trees are planted in an attempt to reduce the amount of waste land.

Once the overburden is removed, the mining is carried on by hydraulic means. Two or three guns direct two-inch streams of water, under pressure, against the wall in which the matrix is found. (Fig. 2) This loosens material which falls into a catchment basin and from there it is pumped to the nearby washing plants where it passes over vibrating screens upon which streams of clear water are played to remove adhering clay and soft phosphate from the pebbles. Each mine has its own washer nearby, altho sometimes the distance may be as much as two and one-half miles, in which case two or three booster pumps located at regular intervals are needed. Altho this is a convenient way to transport the material from the mine, the abrasives in the matrix necessitate frequent replacements of pumps.

Maintaining a constant supply of water for mining is one of the big problems of this area, since an average mine uses 12,000 gallons per minute. To give a better idea of this amount, it may be pointed out that it is approximately the same rate that water is used in Erie, Pennsylvania, a lake port and industrial city of 115,000 people. The situation is somewhat relieved by providing settling ponds so that the water may be re-used several times.

Altho the rainfall is over fifty inches per year, it should be noted that sixty per cent of this comes during the four months from June thru September. During the drier months, especially October to April, many of the surface sources are inadequate and wells are used to supplement the surface supply. Unlike the citrus area to the east, this region has but few natural lakes. Fortunately, about eight to nine hundred feet below the surface are beds of cavernous

Fig. 2. A typical mine in the land pebble area near Brewster, Fla. The overburden has been removed for some distance and has been piled into ridges on the right. Notice the wall of matrix against which two streams of water are being directed by the miners. A considerable gully has been washed out of the center of the wall. Some of the pipes carry water in for mining and others carry the mined phosphate to the washer. The motors for operating the pumps are in the small building in the foreground. A settling pond may be seen in the background to the left. Photo courtesy of The American Agricultural Chemical Co.

limestone which supply large quantities of water, but the cost of drilling wells to this depth is a serious handicap. During the rainy months the pits become flooded and the excess water must be pumped out to the surface streams.

Great quantities of electric power are consumed in the operation of the drag lines and pumps. It has been estimated that twenty-

two and one-half tons of material must be handled for each ton of washed rock. The power is supplied almost entirely by public utility companies.

From the above discussion it may be seen that mining operations are carried on with a minimum of laborers. Not more than two thousand men are employed in all phases of the phosphate mining industry in the state. Mechanization and an efficient industrial system have made possible the mining of phosphate at a very low cost.

Preparation for Market

Conspicuous in the landscape are the drying mills and storage bins. (Fig. 3) These are located in the villages, each drying plant

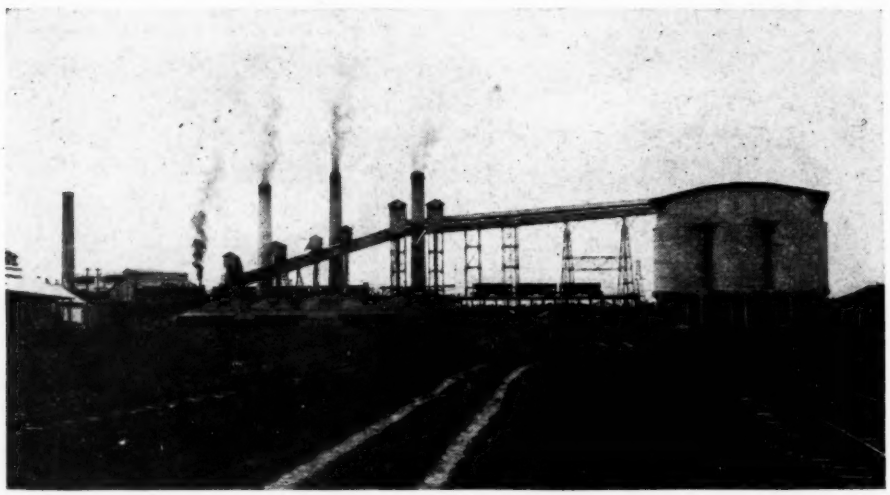

Fig. 3. Drying and storage plants are conspicuous features in the landscape. On the left is the power plant. The low buildings in the center house the kilns. The dried phosphate is stored in the concrete silos on the right. The wet phosphate, brought to the plant in the hopper cars seen on the trestle, is stored directly back of the drying plant and from here it is fed down into the kilns. Photo courtesy of The American Agricultural Chemical Co.

usually serving all the mines operated by one company. Most of the washed phosphate is brought to these plants in open-topped, bottom-discharge cars hauled by the company's locomotives over their own tracks. At the plant the wet phosphate is passed thru large rotating kilns which are heated with fuel oil shipped to Tampa from the Gulf Coast of Louisiana, Texas, and Mexico. Tank cars

were used to transport the oil from Tampa to the drying plant prior to the war but tank trucks have now largely replaced the railroad cars.[2] The dried phosphate is stored in large concrete silos until it is needed—the silos stand over the railroad tracks so that the cars may be loaded by gravity. By taking out the moisture, the tonnage upon which freight must be paid is greatly reduced. Much of the mineral is shipped in covered cars of the hopper type to the ports of Tampa, Port Tampa, and Boca Grande, from which it is taken by ship to the Atlantic Coast ports for preparation as commercial fertilizers.

Soft Rock Phosphate

When the pebbles are washed, much fine phosphate is carried off and accumulates in the settling basins from which it is removed and sold as soft rock phosphate. Since it constitutes only one per cent of the state's output, local farmers provide the entire market for this product which is added to the soil without further treatment. The future of the soft rock deposits is not bright because much of the fine material formerly lost is now being recovered by the flotation process. Simply stated, this process consists of mixing fuel oil, pine oil, alkali, and fatty acids to the sand and fine phosphate washed out of the gravel. The oil clings to the phosphate but not to the sand; therefore the phosphate floats and is skimmed off. Frequently the resulting product is of better quality than the coarse pebbles. While this process has greatly increased the available phosphate in the matrix and extended the life of the land pebble deposits by many years, it has practically eliminated the accumulation of the soft rock deposits for the future.

The Hard Rock Region

The hard rock deposits were the first to be discovered in Florida and for a short time provided the only source of phosphate. However, production of land pebble to the south, where mining is much more easily carried on, soon surpassed that of the hard rock, the latter now contributing no more than two percent of the annual output. This region extends southward from Suwannee County for a distance of one hundred miles as a narrow, meandering belt roughly parallel to the west coast of the peninsula. The areas of

[2] This change was made at the request of the Office of Price Administration.

development are around Inverness, Hernando, and Dunnellon. (Fig. 1) The beds of hard rock were made as precipitates in caverns caused by underground streams in limestone, hence the winding nature of the deposits. Settling of the surface by the collapse of the caverns broke up the deposits so that now they vary in size from small shattered fragments to huge stones weighing several tons. These are imbedded in a matrix of clay and sand. Because of the winding and irregular pattern of the beds and the variation in their thickness, prospecting is subject to many errors.

The overburden is removed by hydraulic means, comparable to the mining process in the land pebble area, but the actual mining must be carried on by other methods. Since most of the hard rock deposits are below the permanent ground water level, the mines are filled with water and dredging is the most common method of extracting the mineral. Because of variation in the size of the stones, it is obvious that the mined phosphate cannot be transported by pipelines and centrifugal pumps. Here small cars are filled with the matrix and are drawn up over wooden trestles to the top of the washer, oversize boulders being crushed before going thru.

As in the region to the south, the hard rock area is served by the Atlantic Coast Line and the Seaboard Air Line railroads. All the washed material is sent to a central drying plant at Fernandina, a port just north of Jacksonville. Prior to 1940 most of the hard rock phosphate produced in Florida was exported to Europe, especially to Germany, but due to the war, exports have been practically nil since that date and production in the hard rock deposits has come to a stand still.

Summary

Florida is well located for fertilizer markets, since the sandy and leached soils of the Atlantic Coastal Plain need to be continuously improved. Because of the ease with which the land pebble deposits may be mined and prepared for market it is not surprising that they provide the largest source of phosphate in the United States. Tampa and Port Tampa are the chief ports for the shipment of this mineral from the land pebble region because they are nearby and the two railroads serving that area focus upon Tampa. The extensive reserves of phosphate rock and the increased demands for fertilizer insure Florida of a productive and remunerative mining industry for a long time in the future.

GEOGRAPHY IN THE POSTWAR ERA— ARE WE PREPARED TO TEACH IT?

JOHN H. GARLAND
University of Illinois

It is indeed impressive to recall the great demands made on professional geographers by the army, navy, and various governmental agencies for innumerable wartime services. The extent to which newspapers, magazines, and books have focused attention upon the values of geographic thinking is likewise gratifying. On the other hand the lack of geographic understanding on the part of the average citizen has been demonstrated over and over again. Clearly then, World War II has provided a powerful stimulus for vigorous growth and development in geography in the postwar era. Therefore, the schools of this country should be well prepared to take advantage of the opportunity when the war is won, and we can devote full time to peaceful pursuits.

CAUSE FOR DOUBT

There is considerable doubt in the minds of many in the academic field that the opportunity thus afforded will be fully capitalized. Various conditions both within and outside of the field of teaching may in no small measure tend to prevent the fullest development of the postwar possibilities. Little can be done directly for conditions beyond our field; within the teaching field of geography we might profitably investigate. Geography is taught thruout our entire school system from the elementary thru the graduate school, yet there is little incentive to advance geographically for one area of instruction does not prepare the student for the next. The benefits of a smoothly working curriculum for geography should be obvious. The feeling that it is undesirable to teach or study the same facts more than once, together with a rather rigid system of courses and course prerequisites makes for a disjointed and brittle system not capable of adapting to new situations. In the postwar era we are quite likely to be faced with new and unusual demands that our system will not be flexible enough to meet in the most satisfactory manner.

Especially in the secondary schools is the preparation poor for, not only is there insufficient geography taught in high school, but

there is also a lack of adequately trained teachers to put the high school program up to proper strength. At the same time much effort has been directed into such channels as the "air age" and the "global world." Much of this is or could be geography, and we might do well to cultivate these courses where the secondary curriculum is crowded and geography, regardless of its cultural and practical values, is unable to obtain space.

The collegiate area has been adversely affected most directly by the diversion of interests to the war effort, the very thing that has stimulated interest in the subject. No doubt geography as a science has been strengthened greatly by the extensive participation of geographers in the many government services during the war. The prestige given the subject is great, but to the same extent the teaching of collegiate geography is at low ebb. With the exception of those directly concerned with the preparation of materials for the instruction of members of the armed forces and those directly concerned with instructing, the war agencies naturally used the talents of professional geographers to further the war effort rather than academic aims. No doubt the rewards to the science of geography will be extremely rich. Unlimited vistas of research have been opened up. New ideas will be brought back from the war experience, but many teachers will not be content to return to the classroom. Just how valuable to post-war thinking the war experience will be remains to be seen; economic geography rose to its place of prominence after World War I, it is earnestly to be hoped that geopolitics, valuable as it is, does not monopolize the geographic stage after World War II.

On the other hand, the well-organized curriculum, the lack of war interruption, and the motivation arising from the war has started many elementary students on an academic future that may be hampered as far as geography is concerned by a poorly coordinated curriculum. Thus a brief curriculum analysis might be profitable and instructive.

Curriculum Analysis

From the instructional point of view geography consists of four intregrated components: (1) a field or universe of facts, (2) an underlying philosophy and its organizing concepts, (3) tools and techniques, and (4) levels of thinking.

Philosophies and Techniques

All geographers are agreed that the natural world is fitting grist for their mill. The systematic development and presentation of the natural environment is, perhaps, the most widely recognized function of geography, especially in the collegiate area where the universal beginning course is "Elements of the Natural Environment." Human and cultural conditions constitute the rest of the material. In some quarters man and the works of man are placed in the same category, whereas some prefer to consider them separately as human and cultural factors.

It is obvious that there is some type of interrelation or interplay among the several factors listed above. Man and the natural environment are the creations of nature, whereas culture is the creation of man, the material items of which must be brought forth from the natural environment. Therein lies the geographic philosophy or philosophies. Many words have been spent in presenting, defending, and attacking varying aspects of these philosophies which, no doubt, is a healthy state of affairs, yet it has its faults for these arguments create confusion in the minds of the public school administrator and focuses the attention of the student on the least important phase of his work.

Since the quality of geographic work is in part the result of the skillful use of materials, it follows that the adequate development of techniques and the skillful use of tools are vital items in preparations to meet postwar demands. There is a firm and laudable belief in most geographic circles that geography is a laboratory science. The field is the geographer's laboratory, is a well-known statement. It is a sad commentary, however, that too often geography is a laboratory science in which the student seldom, if ever, enters the laboratory, and his laboratory exercises consist of the term paper habit of stringing together bits from secondary sources. It is quite apparent that time, distance, and costs are important factors in limiting the actual use of the field. As a substitute, laboratory techniques, and other sources, have been developed but leave a very weak spot at the point where the postwar preparations should be strong—in field techniques. The airplane and aerial photography offer one of the greatest aids to field work; the extent to which they are utilized after wartime restrictions are lifted remains to be seen. If these techniques are used no more effectively than other types

of field devices in the various areas of instruction, geography will enter the postwar period poorly prepared for field investigation.

Levels of Thinking

An especially weak spot in the postwar preparations and one essential to all future planning in the teaching of geography is the confusion of facts with the levels of geographic thinking. Any presentation that emphasizes facts to the exclusion of ideas is weak indeed. Fields of work are differentiated on the criteria that facts take their meaning thru their usage. Within the field of geography it is well to keep in mind that levels of thinking are determined by the types of ideas developed which, in turn, are the results of the usage of facts. The facts that are taught and how they are organized are only the vehicles to geographic thinking and to the level on which those thoughts are pitched. It makes little difference whether a regional or systematic organization is followed, that is a matter of convenience. A regional course is not on a high geographic level just because it deals with regions; it will be on a high geographic level when and only when its concepts contribute to geographic thinking of a higher plane. Obviously the organization of geographic material to contribute to progressively higher levels of geographic thinking is a necessity.

In a program of elementary, high school, and college geography it is convenient to refer to the several areas of instruction as broad divisions in the accomplishment level. Any variations in the usual structure, such as the junior high school or junior college which encompasses portions of two of the areas, will not do violence to the structure. Thus arbitrarily we should have four broad divisions of elementary, secondary, undergraduate, and graduate accomplishment, each of which should be constituted of higher and higher planes of thought accompanied by greater and greater skills in the use of tools and techniques. What then constitutes the broad limits of the several divisions as well as the individual levels within each division? When we have clearly established these standards, geographic accomplishment, let us say at the college level, will not be measured merely by the fact that courses in geography are taken in college but because certain types of attitudes have been acquired and the ability to think geographically at a college level has been demonstrated. These abilities may be developed thru the use of a

wide variety of courses, which may be changed from time to time as social significance demands, thus making for a flexible system geographically designed to help develop the broadest type of world citizen. A summary of the extent to which our geographic system has developed and matured towards these ends might be instructive in light of the postwar preparation.

The Elementary Area. Grades four thru six have made great strides since the close of World War I in clarifying the levels of geographic thinking in the elementary area. Altho there is no complete agreement as to the selection of facts or methods of presentation, three distinct levels of simple geographic thinking have evolved. The lowest, the initial world concept, develops simple human associations with general world location; the second is based on simple economic regionalism, preferably of the homeland for its social significance; and the third level of thinking is concerned with the analysis of selected countries. A selection of several areas, dominated by easily understood cultural conditions and located on the globe from low to high latitudes is sufficient material to develop the initial level. A regional development of the United States, beginning with a large region where the human and cultural conditions are simple and their associations with the natural environmental complex are direct, is desirable material for the second level. A study of Great Britain, France, Germany, Canada, China, or any other group of countries for the purpose of understanding how nations are associated with the site qualities of their natural environments is the type of material developed at the third elementary level. It is well to note that the first level develops a simple frame of world reference and the other two levels fit two types of simple regionalism into this frame. Simplicity is maintained by stressing those human and cultural conditions that can be demonstrated to have direct and obvious associations with the natural environmental complex; that is, the direct and obvious portions of the associations are all that need be emphasized.

The Secondary Area. Secondary geographic thinking begins when a comprehension of world patterns is first reached. Theoretically the work of the junior and senior high schools should be pitched on this level. Actually this is the point where geographic teaching has lost ground and where much work must be done to bridge the gap between the levels of elementary thinking and col-

legiate specialization. The gap probably has been bridged at the expense of the college in which the initial courses are probably of secondary rather than collegiate level.

In the secondary area the first level of thinking, which in many school systems is terminal, is world-wide in scope and is concerned with the interplay of cultures in different parts of the world, such as the dual personality and colonial countries in which spheres of political influence are important factors in the interpretation of their structures. Because of its social significance work on this level should be designed to develop the understandings of the relation of the student's homeland to the rest of the world. The world trade relations, including political implications, of the United States should be developed here.

The first level of the secondary area is normally completed by the end of the seventh grade or the first year of junior high school, and there formal geographic instruction ends in too many American schools. At this point the student is ready to enter the advanced level of the secondary area which should completely develop world patterns and their functions. The world pattern concepts of the advanced secondary level should develop a well-balanced world understanding. Thus world economic, political, and social structures should be presented in their associations with the major world patterns of the natural environment, and, since all levels of geographic thinking are concerned with the association of human and cultural conditions with the natural environment, concepts of the world patterns of natural environmental complexes should be developed at this time. Thus the secondary world concept would bring a broad-minded student, capable of thinking soundly on matters of world-wide importance, to the collegiate areas of specialization in geography.

The Collegiate Area of Specialization. Collegiate geography has, perhaps, developed with little attention to levels of thinking but with great attention to factual details, philosophy, and tools especially those used in research. Research, a most essential item of the academic structure, has far outstripped geographic teaching. Course offerings often reflect the research interests of staff members rather than the contributions of geography to the well-rounded thinking of the student. After World War II we will be faced in college by an unusual combination of young, recent high school graduates and very mature, returned veterans. The latter, because

of their age, experience, and attitudes will create the greatest problem. It is doubtful that the present organization, geared to research, will best serve these men of wide and unusual backgrounds. The emphasis placed on the various war zones and war problems has met with a measure of success, but war problems or even peace problems in a postwar period may not appeal to men who dealt with the realities of those regions. Then too a program on planning for future development might not be approached in an unbiased, scientific manner by men who took part in the original destruction of some of the areas. This is the time to evaluate instruction, determine the appropriate levels of accomplishment, and lay plans covering as wide and rich a field of geographic training as possible. The emphasis should be on the type of thinking most desirable and beneficial to the educated citizen of the postwar world. The courses, the media best adapted to convey the most desirable type of thinking, should change from time to time and place to place with changing demands.

During the short time that geography has been a recognized college subject it has developed rapidly and has enjoyed a wide growth thruout the country. This growth, however, which reflects strongly its physical and economic backgrounds, has not matured sufficiently in all institutions to enable the subject as a whole to take full advantage of the opportunities of the postwar period. Much work will have to be done to clarify collegiate levels of thinking and to provide the necessary new courses best suited to develop most completely the desired concepts which will contribute to the well-rounded thinking of an educated individual.

A cross section of geographic offerings in American colleges seems to indicate the existence of three levels of thinking. As yet they do not seem to be completely crystallized, which indicates the possibility or perhaps the need of further growth and clarification along this line. The college area of specialization is one in which the concepts are based upon detailed factual material thru the skillful use of tools. The initial college level, which is transitional or introductory in nature, is world-wide in scope and now substitutes in a large measure for the secondary area. The extent to which this level has been developed in college is due in part to inadequate development in the secondary area. However, the need for an orientation level will still remain even after the secondary work becomes more extensive. The type of world pattern course offered

at this level should be changed in light of changing needs of the student. The traditional natural environmental and economic courses, when adequately treated in high school and further fortified by political geography, might well be supplanted at the orientation level by a study of the structure of the major world realms. It is hard to determine whether the concepts of the "new global world" are headed in this direction or not. The orientation level provides a frame of references into which future ideas and experiences may be fitted.

The next level of collegiate thinking, which might be considered the elementary collegiate level, probably develops the detailed concepts of regionalism. A wide variety of offerings are available ranging all the way from single regions, states, or countries to areas of continental or even oceanic proportions. A working knowledge of tools and techniques is also necessary, and it is here that the development of field techniques and the use of aerial photography and maps is appropriate.

The third or advanced undergraduate level of thinking seems to be concerned with detailed phases of the science. Intensive natural environmental studies of climate, the ecology of native vegetation, soils, and the like contribute to the concepts of this level as well as such human and cultural items as urbanization, air, water and land transportation, manufacturing, and other types of economic development, as well as social and political problems. At this level more detailed work in techniques both in field investigation and cartographic skills are essential.

The Graduate Area of Research. Because of the all-inclusive interest in research, the graduate area has very clearly set forth that level of accomplishment. College catalogues carry statements to the effect that higher degrees in geography are granted as the recognition of high attainment and ability in the science, and not on the completion of a specified number of courses or at the completion of a specified period of time. The graduate area, which might well be considered as one of training in productive specialization, is fundamentally prepared for the postwar period.

CONCLUSION

In conclusion it is well to stress again the fact that the American school system is not fully prepared to meet the postwar opportunities and demands in geography. It would be nothing less than tragic to let this opportunity slip away without bending every effort

to meet it. Now is the time to evaluate, reinforce, and even rebuild the entire geographic structure. Now is the time for careful and conscientious evaluation of accomplishment levels and the genuinely brilliant selection of courses to develop those concepts. With opportunities thus afforded geography of the postwar era must not fail to make its contributions to the development of the highest type of world-minded citizen so necessary to the development of better world conditions and a lasting peace.

THE GEOGRAPHIC ASCENDANCY OF THE AMERICAS[1]

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Significant changes in human affairs are but rarely recognized by those who observe them. Almost obscured by the smoke of war, this planet has experienced the most epochal shift of power in all history. From the crucible of this terrible conflict has emerged a world cast in a new mold. Global supremacy, long a cherished possession of the Old World, has suddenly crossed to the New. Because of its being by far the dominant nation of the New World, the portents of this new development are of the utmost importance to the United States. In order to benefit by the new power alignment this Republic must be made aware of the unprecedented geographic conditions and strike off the shackles which have long held the peoples of this hemisphere in subservience and fear of the transoceanic world.

For centuries the Old World has been predominant in world affairs; the Americas have long been regarded as mere political and economic appendages to the Eurasian powers. The relative weakness of the New World lands has been and still is widely accepted by geographers and historians. Practically without exception molders of public opinion agree with the conclusions reached by Sir Halford Mackinder a generation ago, namely, that command of the Eurasian-African land mass gave the possessor control of the entire earth.

So general has been this belief in the Old World's invincibility that its universal acceptance in the United States has made it the

[1] In this article the New World, The Americas, and The Western Hemisphere are used synonymously. The Old World and The Eastern Hemisphere are used interchangeably as are World Island and Eurasia and Africa.

cornerstone of our foreign policy. To most Americans it is axiomatic that, should Europe or Asia fall under the sway of a single dominant power, the Americas would be open to speedy invasion. However, this assumption has so lost its validity in the past decade that its continued acceptance constitutes a serious cultural lag in the science of political geography.

Today the nations of the New World decidedly outrank those of the Old in the possession of the various elements which in their total aggregate now represent power on this earth. At the present time the Americas have at their disposal a steadily mounting preponderance of the world's economic and military power. In the ownership of those resources essential to supremacy in peace or war the nations of the Western Hemisphere lead those of the Eastern by a clear margin. By breaking down the ingredients of power into various categories the dominant position of this hemisphere becomes increasingly evident.

Since the beginnings of civilization the influence of a nation has been determined by the force which it has been able to exert in order to gain respect for its rights. In the twentieth century this force can best be measured in terms of industrial output. To a great degree contemporary industrial and military power may be evaluated in relation to the quantity, variety and development of minerals held by a people. The importance of the Western Hemisphere can best be gauged by its rank in the production of the world's eight most valuable minerals. Of these eight products the American nations lead in the output of all but one, and in that one, coal, our production is restricted not by lack of availability, but by limited needs, as North America alone contains seventy per cent of the earth's coal reserves. These basic materials, the foundation upon which rests the structure of the modern state, can enable the nations of the Americas to out-produce the lands of the Old World in every phase of industrial output. The following table lists these eight most valuable minerals and the percentages of each produced in the New World:

Coal	40%	Copper	70%
Petroleum	75%	Zinc	57%
Pig Iron	60%	Lead	60%
Natural gas	98%	Sulphur	65%

In addition, extensive damage to the mines and transportation systems of Europe and Asia have doubtless given the Americas a greater margin of superiority than is indicated by the above table.

In the mineral fuels the slight lead of the Old World, if it still exists, in the production of coal is more than offset by the immense lead of the Americas in the production of petroleum and natural gas. As a consequence the American lands produce well over half of the globe's mechanical energy, and turn out the greater share of its manufactured goods.

In the production of twenty other minerals vital to industrial predominance, the New World produces fifty percent or more of eleven, which, added to our overwhelming superiority in the eight aforementioned mineral elements, insures industrial and military supremacy for the Americas insofar as the physical essentials are concerned.

Natural nitrate	98%	Indust. Blk. Diamonds	50%
Molybdenum	92%	Mica	35%
Vanadium	90%	Fluorospar	33%
Silver	80%	Mercury	27%
Nickel	80%	Bauxite	25%
Platinum	60%	Tin	24%
Antimony	53%	Tungsten	20%
Asbestos	51%	Chromite	8%
Cobalt	50%	Manganese	6%
Bismuth	50%	Pyrites	6%

In comparing the huge land mass of the Old World with the comparatively limited area of the Americas an individual is likely to underestimate the potentialities of the smaller region. Most maps fail to emphasize the vast desert wastes of Eurasia, Africa, and Australia, and thus present an exaggerated conception of the capacities of these continents. Altho including but three-tenths of the land area of the globe, the Americas contain approximately one-half of the cultivable land. The relative absence of deserts in the Western Hemisphere in contrast to the enormous arid regions of the Eastern makes a comparison on the basis of total land area extremely misleading. Equality in the total amount of cultivable land places the American continents in a position to eventually produce half of the earth's agricultural commodities and hence to support half the earth's population if parity in numbers is ever considered desirable.

At the present time the Americas grow a considerable proportion of mankind's agricultural supplies. In the production of such vital crops as cotton, corn, bananas, coffee and flaxseed, to mention only a few, the Americas lead the world. The New World has greater surpluses of beef and wheat for export than the rest of the

world combined. In the event of war or a serious disturbance of trade relations between the two hemispheres the huge agricultural surpluses existing in the American zone would be of incalculable advantage in comparison to the acute shortages which would prevail in the lands beyond the seas. An over-supply of food and textiles in such an emergency would doubtless constitute a serious problem for the leaders of the American nations. However, surplus agricultural commodities are being increasingly used in the plastics field, so that chemistry may be capable of solving any problem of an over-supply which may arise. On the other hand, a rupture of trade relations between the Americas and the trans-oceanic lands would create calamitous food shortages there, which might well result in eventual starvation and chaos in many sections of those populous continents.

Second in importance only to the production of goods is their efficient distribution. This depends on vast systems of transportation and communication, the great value of which too few people are fully aware. As a means of carrying heavy freight waterborne transportation is far superior to any other. The continents of Eurasia and Africa possess no such system of natural waterways as do the continents of North and South America. The counterparts of our Great Lakes, Mississippi, Amazon and Parana river systems can be found nowhere in the Old World.

Likewise the huge land mass of the Eastern Hemisphere suffers from a serious disadvantage in that millions of square miles of its interior regions are inaccessable to efficient means of waterborne transport. The great Eurasian "Heartland" is a vast region having interior drainage or drainage into the Arctic Ocean which is nearly useless for commercial purposes, and too many of the rivers of Asia and Africa are rendered useless for shipping due to the presence of rapids and falls. In the Americas, on the other hand, due to their configuration, no region is remote from the oceans, as is the case in Eurasia and Africa. Also, due to their possession of huge river and lake waterways, few regions are far removed from excellent inland water communications.

The gigantic area of the Old World provides another grave disadvantage in that its very size reacts against it as to becoming an efficient economic unit. Comparing the distance by water from Leningrad to Sydney with that from Seattle to Buenos Aires one can gain some idea of the differences in the resulting time and fuel costs. That the great power centers in the Eastern Hemisphere are

separated by vast deserts and towering mountain barriers is a serious liability, and one not soon to be overcome. The fact that for the most part the shortest distances between North and South America are by water while those between points in Eurasia are by land is a tremendous advantage for the American nations.

In the development of the most effective means of land transportation, the railroad, the Americas with less than half the area and one-seventh the population of the Eastern Hemisphere possess over half the world's railroads. Thus each person in the Western Hemisphere is served fourteen times as effectively by rail as a corresponding individual in the Eastern Hemisphere. In addition, of the world's 45,000,000 automobiles the nations of the Western Hemisphere again have a striking advantage in their possession of some 35,000,000, or over three-fourths. It is difficult to visualize the vital importance of the railroad and the automobile unless we compare the effectiveness of a truck driver hauling tons of merchandise several hundred miles in the same time that the Asiatic coolie or beast of burden may be carrying a load of some hundreds of pounds but a score of miles, or the number of men or animals required to do the work equivalent to that of the freight crew of an American railroad in hauling one hundred cars of goods at a speed of sixty miles an hour.

At the close of this war the nations of this hemisphere will have in their possession over two-thirds of the world's merchant shipping. This huge commercial fleet will be of incalculable value if thrown on the scales of world power politics. That the one-seventh of the world's people living in the Americas will have at their disposal three-fourths of the world's commercial shipping tonnage will confer upon them great advantages for postwar leadership. The value of merchant shipping is obvious in peace and is a vital adjunct to the effective use of naval power in war.

Commercial aviation likewise will be practically an American monopoly. Non-military planes in the hands of the Americas will be far in excess of the total held by the rest of the world. The importance of commercial aviation is clear in this, the opening years of the Air Age. It will be of constantly mounting significance in the arena of international trade and can provide the military services with essential support in the event of armed conflict.

The cessation of hostilities will see the nations of this hemisphere with a total naval tonnage exceeding the remainder of the world's fleet by a ratio of two to one. In military aircraft the same

condition will prevail. It is estimated that the United States alone will possess over two-thirds of the world's military airplanes at the war's end. Overwhelming superiority on the sea and in the air will give the Americas an enormous advantage in the striking power which they can hurl against any foe.

Much is made of the fact that the peoples of the Eastern Hemisphere out-number those of the Americas by a ratio of at least seven to one. The relation of population to power is by no means direct unless other factors such as resources, industrial development, and political cohesion are also considered. A huge population can be a liability as well as an asset. The vast populations of China and India are too large to display economic, political or military effectiveness. Canada with but twelve million people is able to hurl greater military power a longer distance than the five hundred million people of China. A Chinese or Hindu coolie is of considerably less consequence in an economic or military sense than a horse or mule. Unless the energy of a people can be expended on activities other than the sustenance of their own bodies they are utterly valueless in a military sense. Thus we find that nearly all of the people of Asia and Africa are practically useless as far as constituting an economic or military threat is concerned. The three hundred million people of the Americas are more powerful politically, economically, and militarily because they command more of the essential ingredients of power.

In summary, we find the peoples of the New World, altho outnumbered by a ratio of seven to one and in possession of but three-tenths of the earth's land area, are in reality much stronger than these facts would indicate. They hold one-half of the world's cultivable land, produce the bulk of its minerals, operate the major share of its railroads, automobiles, maritime tonnage and commercial aircraft. Their navies rule the seven seas and their military air strength dominates the world's skyways.

Aside from the astonishing development of the power of the American nations the most significant fact is the unprecedented concentration of that power in the United States. This nation possesses roughly one-half the population of the hemisphere and at least ninety per cent of the industrial and military power. Were Russia to add all of Europe to its already vast domains the Soviets would still be able to exert less power in the Eastern Hemisphere than the United States already wields in this Hemisphere.

The American people are generally unaware of the enormous power which has been given them, and are consequently unable to

assume the responsibility which accompanies that power. Geographers should take the lead in assessing this power and in directing it into realistic and positive policies which will harmonize with the national welfare. By evaluating their position the people of this nation can cease being at the mercy of the tide of events which flow from out the Old World and shape their destiny in accordance with the demands of national self-interest. In the years to come the United States will be able to influence world affairs to an unparalleled degree, but only if its people are awakened to a realization of the vital role they can play in world politics.

TEACHING CHILDREN TO READ THE GEOGRAPHY TEXTBOOK

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Reading the geography textbook requires a great number of different reading skills. There are pictures to be read, maps, grafs, statistics, the table of contents, the index, footnotes, and textual material. Ask an elementary teacher about her problems in teaching geography and you are almost sure to find that she considers reading the word matter, or textual material of the textbook, her major problem. Many teachers dismiss the problem by saying that the reading material in the textbook is too difficult. *Instead, they should try to find out why the text is too hard and then so present the material as to make the text readable.*

A practical starting point for the investigation is to give the class a standardized test in reading comprehension and one on vocabulary. Such tests enable the teacher to group the children on the basis of major needs. It is more important, however, to observe how each individual handles the textual material and thus to discover the individual's particular needs.

In a normal classroom situation, the teacher may expect a spread of at least five years in reading ability. For example, a certain fourth grade was given a reading comprehension and a reading vocabulary test. The results showed that the reading comprehension of this class ranged from grade 2.2 to grade 9.4; the vocabulary from grade 2.1 to grade 7.6. The teacher might have assumed that

the fourth grade geography textbook would be too difficult for any child whose reading score was under grade 4.0, and that the text was much too easy for the individual whose score was grade 9.4. However, the way in which the various individuals responded to the class work proved that such an assumption was incorrect.

One boy, whose reading comprehension and vocabulary scores were 2.5 and 2.2 respectively, read geographic textual material with unusual understanding because he had an excellent background for the subject. His deciphering of a paragraph or page of printed material was slow and laborious but each word, each phrase, each sentence held meaning for him.

A girl, whose reading comprehension and vocabulary scores were 4.7 and 4.5 respectively, read the words correctly, but she brought no meaning to a page of geography and therefore took no meaning from the page. She lacked background to understand what she read.

A boy, whose scores were 4.4 and 4.1 on the two tests, could read the geography text and answer questions on the daily work, but at the end of a unit of work his knowledge of the material covered was scattered and unrelated. He failed to grasp basic principles. He never realized major understandings. His work showed that he lacked ability to organize the materials read.

Another boy, whose scores were 2.2 and 2.1 on the two reading tests, proved by his work that he was able to handle the geographic concepts involved in fourth grade geography but that his sight vocabulary was so limited as to prove a real handicap in his ability to read the textual material.

The girl, whose comprehension score was 9.4 and whose vocabulary score was 7.6, had no trouble in the actual reading of textual material nor in grasping the meaning of new vocabulary words but she did not know the purposes for reading geographic material. Her earlier reading experiences had been in reading, English, and arithmetic classes. The work-type reading called for in geography was new to her. She had to have something for which to read. She had to have new purposes for reading.

Thru the testing program and thru observation the teacher found that this class taken as a whole needed vocabulary work, specific purposes for reading, and direction in organizing the findings.

The next step is to consult the work of authorities in geography to find the specific purposes for which one reads geographic textual

material. The study reveals that one reads textual material for these purposes:

A. To find[1]
   1. Cultural items and conditions
   2. Natural items and conditions
   3. Expressed relationships between such items and conditions, and
   4. Inferred relationships between them
B. To check and to supplement information discerned in a picture and from maps, graphs, and statistics[2]
C. To direct one in the use of other tools[2]
D. To identify[2]
   1. Specific personalities with specific regions or countries,
   2. Specific groups of relationships with specific places, and
   3. Specific cultural items with specific natural items
E. To seek statements of authorities[2]; and,
F. To further develop one's[2]
   1. Interest and enjoyment in the reading of geographic and semigeographic material, and
   2. Ability to gather data which will be helpful in solving problems of every day life.

Then the teacher should consult the authorities in reading to find how to present lessons which will help the class to read for these specific purposes. Some teachers feel that they cannot take time to teach a reading lesson in the geography class. By keeping in mind the purposes for which one reads geographic material and reading methods suited to attain these objectives, time so used serves both purposes; teaching the reading of textual materials and teaching geography.

The following exercises have proved helpful to the writer in teaching for this two-fold purpose.

Devices for Teaching Vocabulary

Vocabulary devices are all alike in that there must be a sign symbol and imagery.

Guessing Game[3]

Purpose: To provide drill to help the child connect the sound symbol of a word with its sign symbol.

[1] Logan, M. *Techniques in the Use of the Reading Tool in Reaching Worthwhile Geographic Understandings.* The Journal of Geography, Vol. 33, Jan. '34 pp. 10-16.

[2] *The Teaching of Geography,* The Thirty-Second Yearbook of the National Society for the Study of Education, Public School Publishing Company, 1933. Chaps. X, XVI, and XVII.

[3] Adapted from Broom, Duncan, Emig and Stueber, *Effective Reading Instruction,* McGraw-Hill Book Company, Inc. 1942, p. 263.

Materials: The words printed on the blackboard, on a chart, or on flash cards.

"It" chooses mentally a word from the group and asks, "Which word do you think I have chosen?" He calls on some member of the class who asks, "Did you choose 'desert'?", pointing to the word as he pronounces it. "It" says, "No, I did not choose 'desert' ", pointing to the word, also. This continues until one member selects the word "It" had chosen and becomes "It."

I Am Thinking

Purpose: To provide drill on the sign symbol, the sound symbol, and imagery.

Materials: A set of word cards and a set of pictures.

Place the word cards on the chalk rail. Put the set of pictures on the bulletin board. The teacher may begin the game by saying, "I am thinking of a word which refers to —," giving two or three descriptive ideas about the word. "What word is it?" A child chooses the word from those displayed, pronounces it, and matches it with a picture showing the item. This child is then "It."

Matching Game

Purpose: To help the child connect the printed symbol with the pictured item.

Materials: A set of word cards and a set of pictures.

The teacher or pupil points to an item in a picture, calling upon some member of the class to choose the word which fits the item.

What's What

A vocabulary list may be made in booklet form entitled *What's What* in a certain region or country. The teacher begins the list and then the children take over the work adding those words which they think are needed. Pictures make the record more attractive and provide a check on imagery.

Use of Specimens

Have a class room museum. The children enjoy gathering the specimens. If only one or two specimens are added each month, one has a sizeable collection in a few years. Make flashcard size labels. Do not attach them permanently to the specimen. Then the specimen may be used for testing purposes as well as teaching purposes.

News Articles

Have the children bring to class a news article on the region or country being studied. Have the class find words or groups of words expressing geographic ideas which appear in both the text and the news item. Have them find such words or groups of words which appear only in the text. Then have them find words or groups of words which appear only in the news item.

One Use of Slides

Select a slide showing a number of items which need drill work. Type the names of these items and of a few other items not shown on the slide. The list of words is projected on the screen first. The class is given time to read the words. Then the picture is shown. The children are asked to point to items in the picture which were listed on the first slide and to name the item. To make sure it isn't a lucky guess, the vocabulary words are shown again and each child is told to point to the word he named.

Local Scenery

The local scenery offers many opportunities to present and to drill upon vocabulary words. If you are a fourth grade teacher teaching journey geography and live in a crowded manufacturing district, you may doubt that this is so. Yet, if you take the time to look around you, you will see many items in your locality which fit into a far-off landscape.

Demonstrations

Some words can best be illustrated by demonstration. Fourth graders studying the Congo Region read about the use of *fibers* in making cloth, mats, bowstrings, nets, and fishing lines. The word *fiber* is new to the children. They usually pronounce it "fibber" and attach no meaning to the word. The writer has a plant, commonly known as a Sword Plant, in the class room. Fibers can be torn from a leaf of the plant. The children see what a plant fiber is like. They notice that these plant fibers are too weak to be used for weaving cloth, mats and the like. They begin to appreciate the quality of raffia and banana palm fibers.

EXERCISES FOR DEVELOPING COMPREHENSION

Most modern texts have introductory paragraphs to each unit setting up one or more problems to be solved thru the reading ma-

terial. A fourth grader cannot work on one or more broad problems thru many pages of text material. In each of the following grades there will be some children still reading at fourth grade level. Therefore the main problem must be broken down into parts by the teacher. The teacher can do this by using exercises like the following.

Using Questions

Questions, like other tools of teaching and learning, are graded according to difficulty. The following gradation is used by Mr. Durrell to teach partial reading or rapid skimming.[4] They can also be used to teach children to read with understanding.

A. Use questions which have answers that fairly leap from the page to the eye. Such answers usually begin with capital letters or are written in italic print. It is evident that one could not plan an entire reading-geography lesson using only this type of question. Any one page or even several pages has at most only a few basic facts recorded in this style. But, if the teacher uses this type question at every opportunity afforded by the text and reserves this type question for the poorer reader, she can help the poorer reader increase his ability to read with understanding.

B. Use questions which are phrased like the answer to be found. For example, a sentence reads, "Grass has been planted on the dunes to keep the sand from being blown away by the wind."[5] Phrase the question like this, "Why has grass been planted on the dunes?" Seven of the words to be read from the text are found in the question. These seven words appear at the beginning of the answer to be located.

C. Use questions phrased unlike the answer to be found. The class will read, "The salmon industry is not carried on the year round because the fish swim upstream only during the spring and summer months."[6] The question is phrased something like this, "Why do we say that salmon fishing is seasonal work?

D. Use questions which require several answers. "Why is Birmingham the leading iron and steel center of the South?" "How is lumbering carried on in the Pacific States?"

[4] Durrell, Donald D. *Improvement of Basic Reading Abilities*. World Book Company, 1940. pp. 239-241.

[5] Barrows and Parker, *Journeys in Distant Lands*. Silver Burdett Company. 1936. p. 114.

[6] McConnell, W. R., *Living in the Americas*. Rand McNally and Company. 1939. p. 234.

Comparing Local Scenery with a Far-Off Landscape

Have the class find in a paragraph items typical of some far-off land which can also be seen from the school windows, or on the way to school, or as you drive on the highway from the local community to a certain point. For example, an assignment might be, "Today we are going to read about an important manufacturing district in Germany. As you read you will find many things in this far-off landscape that can be seen here at home. Make a list of these items." If you choose, you may have the class list items which cannot be seen at home. The lists are not the end. To explain the likenesses and differences or the *why* of the landscape is the reason for listing the facts.

Matching Pictures with Paragraphs in the Text[7]

Cut from old texts or magazines pictures which fit four or five paragraphs in the textbook. If there are new vocabulary words to be read, teach these first. Then discuss the pictures with the class to help make the reading which will follow meaningful. Have the class read silently to decide which picture fits which paragraph.

Oral Reading by the Teacher with Interspersed Questions[8]

Have the class follow as you read orally several sentences from the text. Then phrase a question on the next sentence. The children read the next sentence silently to find the answer. Read a few more sentences orally and ask another question. This exercise is helpful when the class has failed to find an important fact or condition when reading silently and you wish to direct their attention to the fact or condition. Be careful not to over-do this type of reading. The fast reader will be forced to slow down his reading to the speed of your voice and the slow reader will lose the place in a very short time.

Oral Presentation

Tell the story of the text in the exact or almost the exact words of the text leaving out important facts or conditions. Have the class read to find those things which you omitted.

[7] This type assignment is used by Barrows-Parker in *Journeys in Distant Lands*. pp. 46-49 and again on pp. 105-106.

[8] Adapted from Durrell, Donald D. *Improvement of Basic Reading Abilities*. World Book Company, 1940. p. 148.

Checking True and False Statements

List on the blackboard a series of statements, many of which are true and a few false. Read the statements to the class. Have the children read the text to check your statements.

Exercises for Organizing the Findings

The Wheel Device

A *Wheel* may be made which is large enough for class use or each individual may make a notebook size "Wheel." Each time a major idea is gained, it is added to the wheel. When the double-wheel device is used, the cultural facts and conditions are written on the under wheel thru the window and the natural facts and conditions on the upper wheel. When the triple-wheel is used, the cultural facts or conditions are written on the middle wheel and the natural on the third wheel. Space the natural items so that they do not fall into order naturally. Then the child must read to find the natural facts and conditions which explain each of the cultural ones given. Thus a series of relationships and a major understanding is built.

The Idea Line[9]

Draw six columns on the blackboard. Head the columns—*What, Where, When, How, How Much and Why.*[10] The children read about one major type of work in a region and report findings which fit into the columns. The teacher records each of the findings in the proper column.

What	*Where*	*When*	*How*	*How Much*	*Why*
Fishing salmon	near coast of northern California; cool waters farther north; cool streams of Washington and Oregon	between March and September	fishing vessels seines trap nets trolling	the most valuable	live in ocean most of time swimming upstream

Arranging Sentences in Logical Order

List on the blackboard sentences about one topic of study. Have

[9] Durrell, Donald D. *Improvement of Basic Reading Abilities,* World Book Company, 1940. pp. 236-237.

[10] The topics for the columns were suggested by Mrs. Erna Grassmuck Gilland.

the class read the text material on this topic. Then have them arrange the sentences, which are on the blackboard, in logical order.

For example, the following sentences are written on the blackboard.

The plants are carefully cultivated.
The plants are set out in the field.
The seeds are planted in special seed beds.
The plants are sprayed to kill harmful insects.
Now and then the shoots are pulled from the stem.

The teacher says, "Now we are going to read about *planting and cultivating tobacco.*[11] Find this paragraph in your text. Read the paragraph silently. Then read the sentences which are on the blackboard. Copy the sentences in the order given in the paragraph."

Using Flash Cards for Teaching Organization

If flash cards have been used for vocabulary work, they may be used in organization exercises, also.

The class may be asked to arrange the cards in two columns, one showing cultural items and conditions, the other showing natural items and conditions.

The class may be directed to build relationships by selecting two or more of the cards.

The class may be asked to arrange the word cards according to topics, such as food, clothing, transportation, and the like.

Listing Cultural and Natural Facts

Head one blackboard *Cultural* and a second *Natural.* Have the class read silently to find cultural and natural items, facts, and conditions in a region or country. Have the children write their findings on the blackboard under the proper heading. Then have them organize the findings into relationships.

[11] McConnell, W. R. *Living in the Americas.* Rand McNally and Company. 1939. pp. 132-133.

WHAT IS IN THE MILE BEHIND AN INCH ON A MAP OR GLOBE

MAMIE L. ANDERZHON
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Introduction

To grasp an understanding of distance behind the scale of miles or representative fraction found on a map or globe requires thought. Pupils need practice in actually seeing how many times the scale of the landscape has been reduced in order to show the pattern or idea expressed by the map, globe or model and what features are not shown. In order that junior high school pupils be able to read distances on maps and globes with some understanding of scale and the distance represented by the scale suggestions are made here for: (1) observations of the actual landscape, (2) comparison and fitting of the landscape into the map, (3) fitting pictures into maps, (4) fitting maps of one scale into maps of another scale.

The purpose of this report is to suggest several activities leaving the details for development in the individual circumstances.

Equipment

1. Globe (preferably a 16 inch globe, 1 inch representing 500 miles). A globe which indicates density of population by size of city symbols also helps the student visualize the parts of the earth where population is concentrated.
2. United States Geological Survey Map of the pupil's home region, scale 1:62,500 if available.[1]
3. Wall map, physical-political of the pupil's state. (A road or highway map of the state can often be substituted if the scale of miles is indicated.)
4. Wall map, physical-political map of the United States.
5. Wall map, physical-political map of the world. It is helpful if the map of the world shows the latitudes every 10°, and the longitudes every 15°, since they coincide with the latitudes and longitudes indicated on the globe.
6. Other maps may be included for further comparisons.
7. Representative pictures of the local regions both aerial and those taken from the ground which show:[2]
   a. people at work
   b. ordinary crops

[1] Obtained from the United States Department of Interior Geological Survey, Washington, D.C. approximately 10¢ per map sheet.

[2] Pictures include such visual aids as film strips, slides, motion pictures, photographs and stereoscopic photographs such as Keystone which give the geographic index for each picture. In so far as practicable cultural features are shown in their natural setting and certain relationships thus suggested.

c. transportation forms
d. building materials
e. seasonal activities
f. economic status
g. standards of living
h. landscape features and use of natural resources

8. Pencil and paper

Background Facts for Understanding Distances and Comparison of Areas

1. There are 5,280 feet in 1 mile
   12 inches in 1 foot
   5,280 times 12 inches is 63,360 inches in 1 mile.
2. 1 mile is approximately 8 ordinary city blocks
   1 city block is 660 feet long (City blocks of course vary in length in different communities).

Constructing a Plan of the Classroom to Scale

It is essential that the pupil understand how to construct a plan to scale. A plan of the classroom may be made to the scale of 1 inch representing 1 foot. The representative fraction is 1:12 since 1 inch on the plan will represent 12 inches of the actual distance. Every object shown on the plan must be proportionally smaller. The pupil begins to see that some details are too small to be shown to scale and if important enough to be included will have to appear in the plan or map in a larger scale. This is what happens on the highway maps, since it is the purpose of a road map to show roads and their classifications, the width of the road is shown larger than the scale of the map.

Mapping to Scale the Square Mile Which Includes the Pupil's Home and School

The class may construct to scale the square mile which includes their school and home using the scale of 1 inch to represent an ordinary block which is 1/8 of a mile. Using the scale of 1 inch to represent 1 block, or 1 inch to represent 1/8 mile, or 1 inch to represent 660 feet, or 1 inch to represent (660 $\times$ 12 inches) 7920 inches, we find the representative fraction is 1:7920. Since there are 63,360 inches in 1 mile it would take 63,360 divided by 7920 or 8 inches to show a distance of 1 mile on a map where 1 inch represents 1 block of 660 feet or 7920 inches.

The plan showing an area of 1 mile each direction or 1 square mile should be completed. The scale may be added in the left lower corner of the sheet and includes:

1:7920 which means 1 inch represents 7920 inches in actual distance,
8 inches represent 1 mile and
1 inch represents 1/8 mile.

One square mile is one section of a township. There are 640 acres in 1 section. Urban pupils can complete the map plan to find how many blocks there are in 1 square mile. They will discover there are 64 square blocks in 1 square mile. Since there are 640 acres in 1 square mile and there are 64 square blocks in a square mile each block will cover an area of 10 acres. Children may then measure to find what part of a city block is covered by 1 acre. (rectangle 330 feet by 132 feet will be 1 acre.)

PEOPLE LIVE IN THE AREA REPRESENTED BY YOUR MAP CONSTRUCTED TO SCALE

Population is recorded in people per square mile. The pupil can learn to estimate the number of people who live in the square mile where he lives. If the dwellings and approximate number of people living in his block are representative of the four blocks in each direction from his home, the pupil can either count or estimate the number of people living in his block and multiply this number by 64 to find the approximate number of people living in the square mile where he lives. When it is not known how many people live in a dwelling the average family can be estimated to range from three to four or five persons.

WHERE DO THE PEOPLE LIVING IN THIS AREA WORK AND MAKE THEIR LIVING?

Observe in the landscape and in pictures the activities people follow in the one square mile around the pupil's home and school to learn what people do to make a living. (Why might one or two occupations found in the community not be representative of the ways people make a living in the community, but indicate the standard of living? Why cannot a single picture always be depended upon to indicate the work people do even in one square mile?)

From the observation of the actual landscape and pictures the pupil can decide what facts about their community their map should tell. Symbols of cultural features such as dwellings, business districts, factories, roads, streets, railroads, and in rural areas fields of crops, etc. should be considered by the class as they decide what features indicate the story of the people's activities. From this ob-

servation of the actual landscape and the use of pictures the pupil begins to form a habit of looking for the relationships in the complexities of man's activities which lie behind the map of a region, a map which has reduced the scale of the original landscape many times in order to bring patterns on relationships into focus.

Maps on a Scale of 1 Inch to 1 Mile and Smaller

Rural pupils may want to extend their maps to a section or 1 square mile so that it includes the entire township. For many places a township is an area 6 miles square and made up of 36 sections. In such a case instead of 1 inch representing 1 block or 8 inches representing 1 mile, the class may let 1 inch represent 1 mile. Compare the area covered by a scale where

8 inches represents 1 mile, Representative Fraction 1:7920 and
1 inch representing 1 mile, Representative Fraction 1:63,360.

On a map where 1 inch represents 1 mile or 1 inch represents 63,360 inches the scale is 1:63,360. For convenience instead of using 1:63,360 a scale of 1:62,500 is frequently used as is the case with our United States Geological Survey Maps (U.S.G.S.). Maps of this scale can include such details as contours, outlines of cities to scale, transportation forms, etc. Many features of the home landscape are shown on these maps by symbols, and valuable information about one's home community can be read from these maps. These maps help one to understand the landscape features which are brought into focus on the map and can be identified both in the landscape and on the map.

Let us try to imagine a globe of this scale 1:62,500 or 1 inch to 1 mile. The diameter of the earth is approximately 8000 miles. On a scale where 1 inch represents 1 mile the diameter of the globe would be 8000 inches or 666⅔ feet which is more than the length of an ordinary city block. A globe of such dimensions would not have much practical use.

The scale of a map may be much smaller. For example a number of maps, including the International Map of the World (I.M.W.), are on the scale of 1:1,000,000 or 1 inch represents 16 miles.

Let us try to imagine a globe of this scale 1:1,000,000 or 1 inch representing 16 miles. The diameter of such a globe would be 8000 divided by 16 or 500 inches. Five hundred inches is 41⅔ feet. Compare 41⅔ feet with the height of your classroom to see how much higher such a globe would be than the room.

Fitting Maps of One Scale into Maps of a Different Scale

Examine the physical-political wall map for your state. What is its scale? How many times smaller is the wall map of your state than the United States Geological Survey Map of your home area?

What information does the wall map of your state tell about

a. Elevation
   1. Where is the lowest region?
   2. Where are the highest regions?
   3. What direction do the rivers flow?
b. Where are the important cities?
c. What transportation patterns are shown on the map? Where do these routes lead? Why?
d. What pictures can you supply which indicate the work of the people? (Suggestion: Begin with your home community and move into the surrounding communities and regions to discover the work and exchange of services between people.)
e. Upon what communities, regions, and countries do you and the people of your community depend for food, clothing, and shelter? For education, culture, enter tainment, etc.?
f. What goes from your community in exchange for what is brought into your community? Where do these commodities go and from what places do they come? What workers contribute to this exchange?
g. Support your statements in "f" with pictures, written facts from sources including books, magazines, newspapers, and maps.
h. Using the scale of miles in the legend of the map, measure your state from south to north and east to west in miles.

Examine the physical-political wall map of the United States. What is its scale? How many times smaller is the wall map of the United States than the wall map of your state? How does the wall map of the United States compare in size with the United States Geological Survey Map of your home region? What details on the Geological Survey Map cannot be included either on the wall map of your state or the wall map of the United States?

Locate your home on the map of the United States, measure a distance of 100 miles from the legend. Locate places within a radius of 100 miles from your home. Find pictures showing the varieties of work and workers within this radius. What is the difference in the number of people living at different places within this 100 mile radius?

How does the relief pattern of your state fit into the relief pattern of the United States? Where are the lowlands in the United States? Where are the mountains? Follow several of the large rivers of the United States from their mouth to their source and from their source down stream to their mouth. What directions do these rivers flow and into what waters do they empty? What cities are located along these rivers? What evidence in pictures found in your textbooks and elsewhere would indicate these cities are important centers of trade and exchange of products between the people of the United States and people of other countries of the world?

Comparing a Map of the World with the Globe

In order to discover how the map of the world compares in size with the globe, the pupil may ask:

1. How many miles are represented by one inch on the map and at what place on the map is this scale accurate?
2. How many miles are behind an inch on the globe?

This information can be obtained from the map and globe scale found in the legend.

To discover where the map varies from the globe the pupil should make the following comparisons:

1. Do all of the meridians meet as they do on the globe at the north and south pole? If not is the point of the poles stretched and how much? (On the Mercator maps the point at the poles is stretched to equal that of the equator which is approximately 25,000 miles.)
2. Is the distance between 15° of longitude at the 60° latitude exactly ½ the distance between the same 15° longitude at the equator on the globe, the same on the map?
3. Are the parallels which are the same distance apart by actual measurement on the globe the same on the map?
   Where is your map of the world stretched as compared with the globe? What parts of your map have been shrunken as compared with the globe? What parts of your map of the world are so accurate you can use the scale of miles to measure distance? Why can't you use the scale of miles on the other parts of the map?

For comparison of areas the pupil can trace on transparent paper the outline of the United States from the globe. Transfer this outline to heavy paper. Cut out the outline of the United States. On this outline of the United States the pupil can letter on one side the size globe for which the outline is made, and how many miles are behind each inch.

Other information can be added as, connecting San Francisco and New York with a colored line and on the line write the distance 2568 miles; Duluth to New Orleans 1000 miles, etc.

Discovering Places Which Have the Same Latitude and Are the Same Distance from the Equator

1. Keeping in mind that the globe represents the earth, locate the place where you live. Since this study was conducted in a suburb of Chicago, we began by locating Chicago, Illinois.[3] The latitude is approximately 42° north of the equator. The distance covered by one degree of latitude is approximately 70 miles. How many miles north of the equator do we live? (42×70 miles is —— miles.)

2. Let us locate other places due east or west of Chicago and which are the same distance from the equator.

[3] Pictures of the local home region were supplemented with pictures, slides and films which showed people at work and their activities in the regions mentioned in places (a) thru (h).

From Chicago, a meat-packing center of the Middle West, let us follow the 42° north latitude due east thru the (a) heavy iron and steel manufacturing region around Detroit, (b) to Cape Cod, near Plymouth, Massachusetts, (c) across the Atlantic Ocean to Europe, we pass thru Rome, Italy, (d) the oil fields of Baku in the Caucasus Mountains, (e) across Asia, north of Tehran and north of the Himalaya Mountains, (f) south of Vladivostok, Union of Soviet Socialist Republics, (g) across the island of Honshu, Japan, (h) across the Pacific to the northern boundary of California.

3. All places having the same latitude are the same number of miles from the equator.

4. All places having the same latitude in the same hemisphere see their noon day sun at the same number of degrees from the horizon and have the same number of hours and minutes daylight and darkness on the same given day.

5. Hobart, Tasmania, is about as far south of the equator as Chicago, Illinois, is north. Following the 42° latitude south of the equator as we did the 42° north latitude what places do we locate? (Note the predominance of water in the southern hemisphere as compared with the northern hemisphere.)

6. The student may select other places located at different latitudes. A chart may develop which includes:

Place	*Latitude* degrees north or south of the equator	*Other Places with the Same Latitude*
Chicago	42° N. Lat.	Plymouth, Massachusetts, etc.
Hobart, Tasmania	42° S. Lat.	
New York City		
London, England		
Magellanes, Chile (formerly Punta Arenas meaning airy point)		
Quito, Ecuador		
Singapore		
Hammerfest, Norway		
(Other places may be selected)		

Comparison of Distance Along a Latitude Due East and West with Great Circle Distance

With a string the student may measure off the distance along a given latitude due east or west say from Chicago to Rome, Italy. The length representing the distance between these two places can

be measured along the equator by allowing approximately 1035 miles for each 15° of longitude covered by the length of the string representing the distance between two places.

Now pull the string taut between the two places. Compare the length of the distance by measuring the length of the string along the equator. If a blackboard globe is available, the string can be chalked and pulled taut between two places. A second pupil can give the string a light pick so that the string springs back to the globe thus marking the great circle distance between the two places. On a map of the world, which has the latitudes and longitudes, the pupil can plot the great circle distance by locating the same points of latitude and longitude on the map as are marked by the chalk line on the globe.

Conclusion

From this experience the pupil acquires an ability to look behind that inch on a map or globe and think more clearly what the actual distance and landscape is behind that inch on the map. The pupil learns to discriminate and distinguish between maps and what they tell. The pupil begins to see that, with enough selected pictures and maps, he can gain a good idea of a region and can read geographic information with more understanding of the meaning of distance and scale.

EDITORIAL NOTES AND NEWS

The war is over. Educational meetings are again the order of the day. The National Council for the Social Studies and the National Council of Geography Teachers will hold a joint meeting at Milwaukee, Wisconsin, at Thanksgiving time. The program is now being formulated. At the time of writing this note, it appears that the meetings will be held November 22, 23, and 24, with joint sessions on Friday, November 23. This is an excellent opportunity for teachers of the Middle West to attend an inspiring meeting. Watch these pages for further information as plans are completed.

Dr. Earl B. Shaw, Professor of Geography, Worcester State College, participated in the Round Table discussion on "Postwar Trade with Latin America," held in conjunction with the Inter-American Institute which met in March in Worcester, Massachusetts. The Institute is sponsored by the Pan American Committee of Worcester in cooperation with the Foreign Policy Association (Worcester Branch), the Worcester Art Museum, Clark University, and the Free Public Library. About one hundred fifty business men were present at the discussion which was led by Dr. de Haas of Harvard. A number of prominent business executives addressed the Institute.

VICTOR P. STARR, Department of Meteorology, University of Chicago, is the editor of the new quarterly, *The Journal of Meteorology*, sponsored by the American Meteorological Society. The publication will feature original papers on theoretical and applied meteorology.

About seventy million maps were produced preparatory to the Normandy invasion. These maps were of many special kinds. Each fighting man was given the kinds that would be most useful to him in attaining a specific goal in the invasion program. The mass of details printed on the maps used in this war is almost incredible. Equally astonishing is the abuse many of the maps will stand from being repeatedly folded or from being exposed to rain, dirt, and grease. One of these types of maps, put into many air-sea rescue kits, is printed on a Celanese handkerchief and is not injured by sea water or heat.

Vessels are sometimes unable to dock at Mollendo, ocean terminal of the Southern Railway of Peru, due to the harbor's lack of protection from storms. This has been a serious handicap to the handling of cargoes, as well as passengers desiring to make rail connection to visit the famous Inca ruins at Cuzco. A few years ago the new port of Matarani was developed a few miles north of Mollendo. Matarani, however, had no rail connections with either Mollendo or with the Southern Railway out of Mollendo. It was recently announced that the latter railway construction has been started and will be pushed as fast as priorities permit. The harbor at Matarani is enclosed by two breakwaters and has a depth of 36 feet at the wharf. Port facilities include modern fireproof warehouses, an administration building, and a customs office. The new railway is expected to increase postwar travel to southern Peru and thence to Bolivia by way of Lake Titicaca. To this end, the Peruvian government has erected modern tourist hotels at Arequipa and Cuzco.

It is reported that 120 million gallons of gasoline were delivered thru the pipe-line system under the English Channel to the Allied Armies in Europe during the period from August 12, 1944, to May 8, 1945. These pipe lines were laid by British engineers in cooperation with the British Navy. The pipes were wound around special drums like thread on a spool. As these drums were towed across the Channel, the pipes were laid with such efficiency that it took but ten hours to lay the lines from the Isle of Wight to Cherbourg. Other lines were laid with even greater speed. The pumping stations were cleverly camouflaged. The whole system was known as "Operation Pluto."

Wartime curtailment of shipment of Indian jute has resulted in the extensive use of the fiber of the Caroá plant. The long hard leaves resemble those of the Century plant. Caroá grows wild in the dry sections of northeastern Brazil, Pernambuco being the principal source. Caroá fiber is hard and durable, and suited to the manufacture of sacks, wrappings, and cordage for a great variety of purposes. Experiments in weaving the fibers are reported encouraging for canvas and textiles for clothing.

The American Congress on Surveying and Mapping held its fifth Annual Meeting in Washington, D.C. on June 23, 1945. Commander Frank S. Borden, of the U. S. Coast and Geodetic Survey was elected President, Major Richard T. Evans was named Secretary-Treasurer, and A. L. Shalowitz was named Editor of "Surveying and Mapping," the quarterly journal of the Congress. The meeting included a panel discussion on "Co-operation Among the Technical Organizations," in which representatives from the American Society of Civil Engineers, the American Society of Photogrammetry, the American Geophysical Union, and the American Congress on Surveying

and Mapping participated. The Congress on Surveying and Mapping was organized in 1941 for the purpose of advancing the sciences of surveying and mapping and to contribute to public education in the use of maps and to encourage the promotion of basic mapping programs.

While drilling for oil in the Rattlesnake field in the Navajo Indian Reservation, a gas was brought in which would not burn. Analysis revealed an eight per cent concentration of helium. This is rated a high yield of helium. Gas storage facilities, pipe lines, a processing plant, and homes for the workers were provided in a relatively short time in this primitive region in northwestern New Mexico. The helium gas goes by pipe line some ninety miles to Gallup where storage facilities are provided for three million cubic feet of gas along with the provision for direct loading into cylinders arranged on railroad cars. This storage capacity is not excessive when we consider that it takes six million cubic feet of helium to fill one of the former Zeppelin-type dirigibles. As the Navy now has more than its needs of helium, some is now available to commercial concerns.

It was recently reported that the United States had a proved natural gas reserve in excess of 140 trillion cubic feet, Texas alone having more than 82 trillion cubic feet. Total production in 1944, including flared and wasted gas, was 4 trillion cubic feet. Oil and gas are intimately related, and include in their composition many of the same components. It may be in the not-too-distant future that 10,000 cubic feet of gas may be regarded as a potential barrel of oil. Conservation of this gas is therefore a matter of serious concern to the United States as a whole.

GEOGRAPHICAL PUBLICATIONS

James T. Worlton. **Conservation, A Regional Approach.** Oxford Book Company, New York. 1944.

This book marks a distinct break with tradition in being one of the first efforts to organize high school conservation on a regional basis. The pioneering status of the book may go far to account for the failure, in places, to distinguish conservation from regional geography, and that from regional social science. Indeed, as a regional treatment the book stems back to the regional studies of Howard Odum rather than to those of J. Russell Smith.

The regional divisions are eight: New England, The Eastern Industrial Region, The Southeast, the Great Lakes Region, The Southwest, The Great Plains Region, The Pacific Northwest, and the Pacific Southwest. These are familiar divisions and provide the minimum number of primary divisions of the country, altho each is too diversified for brief descriptions to be very effective.

As an approach to conservation, the regional method has easily recognized strengths and weaknesses. Good: it is realistic, tied down to earth; questionable: it causes repetition, limits the space that can be devoted to a particular theme, and shifts attention away from the conservation problems of the student.

This high school text will be welcomed by many as providing another regional geography with a conservation slant (thus supplementing Smith's *Men and Resources*); and as strengthening the teaching of conservation in two ways—by injecting much reality thru the regional approach, and by giving a large amount of space to human resources.

J. R. WHITAKER

George Peabody College for Teachers

Frances Carpenter. **The Pacific: Its Lands and Peoples.** 502 pp.; photographs, maps, index. American Book Company, N.Y., 1944. **$1.40.**

A pleasing first impression of *The Pacific: Its Lands and Peoples* is gained from the legible print, uncrowded pages, and numerous illustrations. The pictures are well-selected. The black and white maps, bled to the edge of the page, are clear and on a scale more satisfactory than in most books of this type. They show sketched-in topography, major cities, and principal transportation routes.

The book is of the kind commonly called a supplementary reader, designed to enrich the social-studies or the geography in the upper grades or junior high school. The declared purpose of the author is to "stimulate the interest of the pupil in the lands and peoples of the Pacific; to help him to an understanding of the advantages and disadvantages of the environments of its various peoples; to arouse in him an appreciation of their ancient cultures and of their efforts to progress; and to make real to him the mutual need for understanding and cooperation between the United States and its neighbors across the Pacific."The material selected emphasizes the activities of the people and is well chosen to interest the students.

The title will mislead those who look for rich material on the lands of the Pacific that have been headlined in current events. The text treats not only the lands that lie within the Pacific or border it, but in addition Inner Asia, Soviet Asia, and India. Out of 483 pages of text, 29 are devoted to the islands of the Pacific including the Hawaiian Islands, 26 pages to Australia.

The author has avoided some of the problems of writing about Asia and the Pacific while World War II is in progress by using the device of an imaginary journey taken in an undated time of peace. Only occasional references and a brief account of the highlights of history up to 1943 acknowledge the existence of the war. In the chapters on Japan the reader is told of doll festivals, rice fields, the homes, the love for flowers; then he is reminded that it is hard to think pleasant thoughts of Japan and that these same artistic people have always admired warriors. Judging from the vocabulary, the pupils reading the book would be old enough to welcome more substantial material that would give a firmer background for understanding the many problems of the Pacific lands.

Important contributions to children's materials are the clear, brief outlines of history of eastern Asia, and the up-to-date treatment of Soviet Asia. Worthy of notice, also, are the pages given to the descriptions of "low" and "high" islands, and the paragraphs given to such personalities as Gandhi. The book would make a worthwhile addition to the library of every classroom studying the geography of the regions included in the book.

KATHERYNE THOMAS WHITTEMORE

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James C. Malin. **Winter Wheat in the Golden Belt of Kansas.** 289 pp., notes and index. University of Kansas Press, Lawrence, Kansas. 1944.

This book, "a study in adaption to subhumid geographical environment," is an interesting presentation of the upper Kansas Valley, the area where the several streams from the Great Plains—the Blue, Republican, Solomon, Saline, and Smoky Hill—converge to form the Kansas. Riley, Geary, Dickinson, and Saline with their principal towns of Manhattan, Junction City, Abilene, and Salina are the counties under consideration. Because it is the transitional belt between the relatively humid prairie of eastern Kansas and the definitely subhumid edge of the great Plains, this area was

especially selected for study as a "segment of a comprehensive research program that has been carried on for more than a decade."

The author is a historian and has used the techniques of historical research and the chronological order of presentation, yet he does not lose sight of the fact that he is primarily concerned with the relations of cultural developments to the subhumid environment of an area of Kansas. The material is presented in three parts each of which is chronologically as well as culturally delimited. Part I, Beginnings, 1855-1872, deals with cultural adjustments to a new and strange environment. Part II, 1872-1882, the Soft Winter Wheat Boom, and Part III, the Emergence of the Hard Winter Wheat Regime, explains the development of the single cash grain economy. The date selected to close the study is very interesting, for there has been over forty years of winter wheat in the Golden Belt since 1902, a period almost as long as the one presented. In an epilogue of six pages the author points out that by the turn of the century the usual sources of local history, chiefly the newspapers, were no longer adequate. The editors became interested in emphasizing the growth of "new Chicagos of the Plains," manufacturing establishments, street cars, water works, and the activities of local society leaders to the exclusion of the farmer and his activities.

Altho the geographer would be interested in the same type of presentation of the present period in the Golden Belt, he will find the detailed analysis of the earlier periods stimulating and worth while.

John H. Garland

University of Illinois

South Carolina: Economic and Social Conditions in 1944. 239 pp.; maps, tables, diagrams, selected references, and index. University of South Carolina Press, Columbia, 1945, $2.50.

This volume is a contribution of seven University of South Carolina professors and an eighth contributor, a practical farmer and a well-known agricultural economist in the state. The purpose of the book, the first issued by the University of South Carolina Press, is "to present the salient facts connected with certain major problems of South Carolina life."

The first chapter "Natural Resources" is written by Dr. James T. Penney, Teaching Fellow and Research Assistant in Zoology. He discusses the natural resources under the following six heads: Climate; Water Resources; Minerals Resources; Forest Resources; Soil Resources; Wildlife Resources. The treatment is encyclopedic thruout.

Chapter two entitled "Population" is written by Dr. Julian J. Petty, Associate Professor of Geography. The population problem is analyzed under the following subdivisions: General Growth and Distribution of the Population; Births and Deaths and the Rate of Natural Increase; Redistribution of South Carolina Population; The Composition of the Population; Population Prospects for the Future. The analysis is rather complete.

The third chapter, "Manufacturing Industries," is written by Dr. S. M. Derrick, Professor of Economics. The following topics are treated: Historical Background; Growth; The War Period; Comparative Growth; Economic Characteristics; Prospects and Problems. Here again the treatment tends to be factual and encyclopedic with little explanation or analysis.

Chapter four entitled "Income and Savings" is written by Professor George McCutchen, Professor of Economics. The following topics are treated: State Income; Income in Agriculture; Earnings in Manufacture; Financial Resources. The analysis is rather thoro.

Chapter five, "Agriculture" is written by Alfred G. Smith, a practical farmer who

served for ten years as Agricultural Economist with the U.S.D.A. After a brief introduction the following topics are treated: Past and Future; Conditions in 1944; Farm Crops; Livestock; Factors in the Evolution of the Farm; The South Carolina Farmer of the Future. While the treatment is brief the analysis is rather complete. A definite attempt has been made to interpret agriculture to the reader. However, the natural environmental factors conditioning agriculture have been touched lightly.

The three final chapters: State Governmental Organizations, Public Education, and Public Welfare, are written respectively by Dr. George R. Sherrill, Professor of Political Science, Dr. J. McT. Daniel, Director of the University High School and Professor of Education, and Dr. George Croft Williams, Professor of Sociology and Director of the School of Social Work. These three chapters covering ninety pages treat the respective subjects in a very thoro manner.

This volume is in no sense a geography of South Carolina, nor was it intended to be. Certain chapters, however, contain many facts as well as some interpretations in which students of geography will be interested.

FLOYD F. CUNNINGHAM

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NEW PUBLICATIONS

Ambrose Caliver. **Education of Teachers for Improving Majority-Minority Relationships.** Bulletin 1944, No. 2. 64 pp. Illustrated. Federal Security Agency, U. S. Office of Education. 1944. 15 cents.

Course offerings to assist teachers in learning about our minority groups; aids in understanding problems arising between these groups; and suggestions for promoting better relations between the groups.

South Carolina: Economic and Social Conditions in 1944. W. H. Callcott, Editor. University of South Carolina Publications. Series 1, The Social Sciences, Vol. I. 239 pp. Illustrated. The University of South Carolina Press, Columbia, S.C., 1945.

Each of seven University staff members contributed a chapter, each of which deals with a special unity of study. The eighth chapter, dealing with agriculture, was developed by a man outside the staff who is a farmer and an agricultural economist.

Distances and Directions from New York. American Geographical Society Outline Map Series No. 6, 1944. The American Geographical Society, Broadway at 156 St., New York 32, N.Y. 1944. 50 cents.

This azimuthal equidistant projection centered on New York is on the scale of 1:35,000,000. Distances from New York, computed easily by a linear scale in statute miles, may be read to most parts of North America, to all of South America, to Europe as far east as Moscow, to all Mediterranean lands, and along the west coast of Africa to Capetown.

Berry's Relief Desk Outline Maps. 11″ by 16½″. Rand McNally & Co., 536 So. Clark St., Chicago 5, Ill.

The relief is brought out by highlight and shadow shading. The series includes a map of the United States and each of the continents.